

IN THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (Previously Presented): In a digital communication system employing forward error control and having a decision-directed tracking loop with an adaptive element, a method for selectively updating the adaptive element, said method comprising the steps of:

- (a) generating an estimate of a data symbol from an output of the adaptive element;
- (b) computing an error signal from the estimate of the data symbol and the output of the adaptive element;
- (c) computing one or more decision quality indicators of estimates, detecting transmission errors over the one or more decision quality indicators of the estimates in a window, and generating a decision quality indicator dependent value; and
- (d) updating the adaptive element with the error signal based on the decision quality indicator dependent value, wherein the one or more decision quality indicators are syndromes.

2. (Canceled).

2. ~~3.~~ (Previously Presented): The method of claim 1, wherein
- the one or more decision quality indicators of estimates are computed using a parity check operation; and
 - the transmission errors are detected by a transmission error detection operation over the syndromes contained in the window of shift registers.

3 ~~4~~². (Original): The method of claim ~~3~~² wherein the transmission error detection operation is an inclusive 'NOR' operation.

4 ~~5~~². (Original): The method of claim ~~3~~² wherein the window has a length equal to one.

6. (Canceled).

5 ~~7~~. (Previously Presented): The method described in claim 1 wherein step (d) comprises the further steps of:

- (i) multiplexing the error signal with an adaptation-disabling value; and
- (ii) disabling the updating step when a transmission error is detected.

6 ~~8~~. (Original): The method of claim 7 wherein the adaptation-disabling value is a zero value.

7 ~~9~~. (Previously Presented): The method described in claim 1 wherein step (d) comprises the further steps of:

- (i) analyzing the decision quality indicator dependent value to determine if the transmission errors have occurred; and
- (ii) rejecting a tentative update if it is determined that the transmission errors have occurred.

9 ~~10~~. (Previously Presented): In a digital communication system employing forward error control and having a decision-directed tracking loop with an adaptive element, a method for selectively updating the adaptive element, said method comprising the steps of:

- (a) generating an estimate of a data symbol from an output of the adaptive element;
- (b) computing an error signal from the estimate of the data symbol and the output of the adaptive element;

- (c) determining if one or more of the estimates of the data symbol has one or more probable errors within a window of shift registers; and
- (d) selectively disabling updates of the adaptive element with the error signal if a determination has been made that the estimate of the data symbol has a probable error within the window of shift registers.

¹⁰ ~~11~~. (Original): The method of claim ⁹~~10~~ wherein the adaptive element performs an equalization function.

¹¹ ~~12~~. (Original): The method of claim ⁹~~10~~ wherein the adaptive element performs a timing recovery function.

¹² ~~13~~. (Original): The method of claim ⁹~~10~~ wherein the adaptive element performs a carrier recovery function.

¹³ ~~14~~. (Original): The method of claim ⁹~~10~~ wherein the adaptive element performs an automatic gain control function.

15. (Previously Presented): In a communication system employing a forward error control code and an adaptive processor, a method for selectively updating the adaptive processor, the method comprising the steps of:

- (a) calculating a decision quality indicator of an estimate wherein the estimate is obtained from an output of the adaptive processor;
- (b) calculating a signal error from the estimate and the output of the adaptive processor;
- (c) determining if a sequence of the decision quality indicators within a window contains at least one transmission error representative value; and
- (d) disabling an update of the adaptive processor when the at least one transmission error representative value is present within the window.

16. (Previously Presented): The method of claim 15 further comprising the step of:

- (e) enabling the update of the adaptive processor when the sequence of decision quality indicators within the window does not contain the at least one transmission error representative value.

17. (Canceled).

~~17~~ ~~18~~. (Previously Presented): The method of claim 15 wherein the forward error control code is a block code and the size of the window of step (c) is set equal to the size of a block of information.

~~18~~ ~~19~~. (Previously Presented): The method of claim 15 wherein the forward error control code is a convolutional code and the size of the window of step (c) is set equal to the constraint length of the convolutional code.

~~19~~ ~~20~~. (Previously Presented): The method of claim 15 wherein the adaptive processor is based on a block update with a certain rate and wherein the size of the window is set proportional to the block update with the certain rate.

21. (Previously Presented): An apparatus for selectively updating an adaptive element of a communication system, the apparatus comprising:

- (a) a quantizer for generating an estimate of a symbol from an output of the adaptive element;
- (b) an error calculator for computing a difference between the output of the adaptive element and the estimate;
- (c) a decision quality estimator for computing one or more decision quality indicators of estimates within a window and generating a decision quality indicator dependent value, wherein the window has a length that is a function of a forward error control code; and

- (d) an adaptation controller for controlling the updating of the adaptive element based on the decision quality indicator dependent value.

22. (Original): The apparatus of claim 21 wherein the adaptive element is an adaptive equalizer.

23. (Original): The apparatus of claim 21 wherein the adaptive element is a carrier recovery circuit.

24. (Original): The apparatus of claim 21 wherein the adaptive element is a timing recovery circuit.

25. (Original): The apparatus of claim 21 wherein the adaptive element is an automatic gain control circuit.

26. (Original): The apparatus of claim 21 wherein the decision quality estimator is a syndrome calculator.

27. (Original): The apparatus of claim 26 wherein the syndrome calculator comprises:

- (i) a parity check calculator; and
- (ii) an enable generator containing a window of shift-registers, the enable generator having an output based on a NOR operation performed over the contents of the window of shift-registers.

28. (Previously Presented): The apparatus of claim 21 wherein the adaptation controller is configured to multiplex an error signal with an adaptation-disabling value, the adaptation controller having an output based on an output of the decision quality estimator.

29. (Previously Presented): An apparatus for selectively updating an adaptive element of a communication system, the apparatus comprising:

- (a) an estimation circuit for generating an estimate of a symbol from an output of the adaptive element;
- (b) an error calculating circuit for computing a difference between the output of the adaptive element and the estimate;
- (c) a transmission error estimation circuit for identifying probable errors in a sequence of decision quality indicators within a window, wherein the window has a length that is a function of a forward error control code; and
- (d) an adaptation controller for controlling the updating of the adaptive element based on the identification of the probable errors in the sequence of decision quality indicators.

30. (Original): The apparatus of claim 29 wherein the adaptive element is an adaptive equalizer.

31. (Original): The apparatus of claim 29 wherein the adaptive element is a carrier recovery circuit.

32. (Original): The apparatus of claim 29 wherein the adaptive element is an automatic gain control circuit.

8 ~~33~~. (Previously Presented): The method of claim 1, wherein the window has a length that is a function of a forward error control code.

14 ~~34~~. (Previously Presented): The method of claim 10, wherein the window has a length that is a function of a forward error control code.

20 ~~35~~. (Previously Presented): The method of claim 15, wherein the size of the window is dependent on a forward error control code.